UNIVERSITY OF CALIFORNIA

LAWRENCE RADIATION LABORATORY
P. O. BOX 808
LIVERMORE, CALIFORNIA 94551

January 27, 1970

Dr. Joshua Lederberg
Professor of Genetics
Stanford University School of Medicine
Department of Genetics
Stanford, California 94305

Dear Dr. Lederberg:

I want to thank you for your letter of 12 January. I recognize that your schedule is quite filled and I certainly do appreciate the fact that you took the time out to respond to my letter.

I agree with your comments concerning the Johns Hopkins study. It is difficult to understand how a non-disjunction of the X-chromosome could have lead to the difference in the male/female ratio that was observed without having produced a group of children with rather severe disease that were live born. On the other hand the results were so startling that I do think it is essential to discover the basis for the observed sex ratio.

With respect to the induction of leukemia and other forms of childhood cancer as a result of prenatal irradiation, I am enclosing a copy of a letter from Dr. Alice Stewart. In this letter, she indicates that they have enlarged their study and they are now able to show a relationship between dosage and the induction of childhood leukemias. I agree, it does appear to be a rather large effect for such a small dosage, on the other hand, these recent observations of Dr. Stewart suggest that it may indeed be real.

When the doubling dose concept that we have used is applied to a population different from the one on which the doubling dose was determined, it is true that we would have to add the additional assumption that the radiation would act synergetically with the environmental factors that were part of the determinants of the cancer frequency in the other population. I am enclosing a copy of a report that we have just prepared that deals with this particular aspect of the doubling dose concept. As you will see from this report, we give two examples of the existence of synergism and both are related to smoking. The one deals with the incidence of cancer in uranium miners and the other deals with the relationship in asbestos workers. In both cases the radiation and the asbestos acted in a synergistic manner with smoking. Although we do not have anymore data at present, it would seem reasonable to propose that radiation would also act in a synergistic manner with other forms of atmospheric pollution.

I am sending you under separate cover, a copy of our Handbook. This Handbook is intended to be continuously updated so from time to time you will receive the updated portions of the Handbook. I am enclosing with this letter a tabulation that will be in the next update. This tabulation relates the microcuries per gram of tissue that would lead to a dosage of 1 R/yr. I think this tabulation may be particularly useful for your purpose. We will also include with the Handbook some of the material that we have on the biological effects of radioiodine. So far as krypton-85 is concerned, there is very little biological information available. We are undertaking a study to try to bring together the information on stable krypton and the general information on the biological effects of radiation in order to develop some feeling for the potential effects of krypton. As soon as we have that information in reasonable form, I will send that along to you also. Krypton certainly is a hazard to the lung and possibly also to the gastrointestinal tract. Our problem with interpreting the general effects on the body concerns the distribution of krypton within the body. It has an enhanced solubility in lipids. Since these materials form the major portion of all the biological membranes, this is the aspect of the problem that we want to study in some detail in order to decide to what extent krypton actually represents a hazard to tissues other than the lung or the GI tract.

Sincerely yours,

Arthur R. Tamplin

Arthur R. Tamplin
Bio-Medical Division

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Encls. as stated